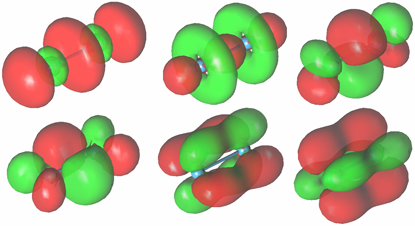
Section 5.11

Molecular Compounds



Molecular Compounds contain **neutral groups of atoms** called molecules.

Covalent bonds are created when **nonmetal atoms** and their outside valence rings share electrons that hold atoms together.

Diatomic molecules are made from **two similar atoms** creating a covalent bond.

Example: Symbol Formula State

1. Hydrogen H H2 gas
2. Oxygen O O2 gas
3. Nitrogen N N2 gas
4. Fluorine F F2 gas
5. Chlorine Cl Cl2 gas
6. Bromine Br Br2 liquid
7. Iodine I I2 solid

Atoms of different elements can also form covalent bonds.

Combining capacity of a nonmetal is a measure of the number of covalent bonds that it will need to form a stable molecule. This number replaces the ionic charge for writing formulas.

Combining capacities of nonmetal atoms copy this chart down with your cheat sheets

|  |  |  |  |
| --- | --- | --- | --- |
| 4 | 3 | 2 | 1 |
|  |  |  | H hydrogen |
| C carbon | N nitrogen | O oxygen | F fluorine |
| Si silicon | P phosphorous | S sulfur | Cl chlorine |
|  | As arsenic | Se selenium | Br bromine |
|  |  |  | I iodine |

Writing formulas for molecular compounds:

Step 1:

Write the symbols left handed element first

C S

Carbon Sulfur

Step 2:

Add the combining Capacity (instead of the ionic charge)

4 2

C S

Step 3:

How many of each will create a balanced molecule

4 = 2 how do we balance this?

4 = 2(2)

Step 4:

Write the formula

C1S2 or CS2

Try the following

1. Silicon and oxygen
2. Nitrogen and hydrogen
3. Phosphorus and chlorine
4. Sulfur and bromine
5. Oxygen and fluorine

Answers

1. Silicon and oxygen

Step 1 Si O

Step 2 4 2

Si O

Step 3 4 = 2(2) = 0

Step 4 SiO2

1. Nitrogen and hydrogen

Step 1 N H

Step 2 3 1

N H

Step 3 3 = 3(1)

Step 4 NH3

1. Phosphorus and chlorine

Step 1 P Cl

Step 2 3 1

P Cl

Step 3 3 = 3(1)

Step 4 PCl3

1. Sulfur and bromine

Step 1 S Br

Step 2 2 1

S Br

Step 3 2 = 2(1)

Step 4 SBr2

1. Oxygen and fluorine

Step 1 O F

Step 2 2 1

O F

Step 3 2 = 2(1)

Step 4 OF2

Date: Name:

Naming / Formula Review – using the cheat sheet provided in class try naming all the examples completed in class, provide the formulas first:

Ionic compounds formula name

1. Lithium and fluorine\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Calcium and bromine\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Sodium and nitrogen \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Aluminum and nitrogen\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Sodium and iodine\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Polyatomic compounds

1. Sodium phosphate\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Calcium sulfate\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Potassium chlorate\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Aluminum hydroxide\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Beryllium nitrate\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Molecular compounds

1. Silicon and oxygen\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Nitrogen and hydrogen\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Phosphorus and chlorine\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Sulfur and bromine\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Oxygen and fluorine\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Section 5 Review

Assemble all cheat sheet information on one 8x10 sheet of paper that will be useful for the test.